

NOAA Climate Reanalysis Task Force Technical Workshop

**NOAA Center for Weather and Climate Prediction
College Park, MD**

4 - 5 May 2015

Organizers: Jim Carton, Gilbert Compo, Arun Kumar, Suru Saha, Heather Archambault

Workshop Objectives:

- Report on NOAA Climate Reanalysis Task Force progress
- Exchange reanalysis approaches, algorithms, and techniques currently in use and under development.
- Discuss techniques for addressing outstanding issues in the reanalysis efforts, e.g., presence of spurious discontinuities and trends, coupling of Earth System components, inclusion of new areas such as aerosols.
- Identify the various requirements for reanalysis products.
- Determine strategies and overlaps for national and international reanalysis efforts based on scientific drivers for climate and weather research.

Each presentation slot is 80% for oral presentation and 20% for questions.

Monday 4 May

8:00–9:00 a.m.	Registration
9:00 a.m.	<i>Welcome</i> Arun Kumar, NCEP/CPC
9:05 a.m.	<i>Introduction to the Climate Reanalysis Task Force and Workshop</i> Gil Compo, U. of Colorado/CIRES & NOAA/ESRL/PSD
9:20 a.m.	<i>What is Reanalysis for?</i> Huug van den Dool, NCEP/CPC

1. National and International Reanalysis Efforts

Objective: Determine strategies and overlaps for national and international reanalysis efforts based on scientific drivers for climate and weather research.

Session Chair: Gil Compo, U. of Colorado/CIRES & NOAA/ESRL/PSD

Rapporteur: Jeff Whitaker, NOAA/ESRL/PSD

- 9:40 a.m. *Plans for Reanalysis at NCEP's Environmental Modeling Center*
Suru Saha, NCEP/EMC
- 10:00 a.m. *Issues, Requirements, and Research towards NOAA's Next Generation of Climate Reanalyses*
Arun Kumar, NCEP/CPC
- 10:20 a.m. Coffee Break
- 10:40 a.m. *Reanalysis at ECMWF*
Dick Dee, ECMWF
- 11:00 a.m. *CMA 40-year GSI based reanalysis: plans and progress*
Zhiquan Liu, NCAR
- 11:20 a.m. *MERRA-2, GMAO reanalysis efforts/plans*
Ron Gelaro, NASA/GMAO
- 11:40 a.m. Discussion
Moderator: Heather Archambault, NOAA/CPO
- 12:10 p.m. Lunch

2. Developments in the Stratosphere

Objective: Discuss techniques for addressing outstanding issues in the reanalysis efforts

Session Chair: Ron Gelaro, NASA/GMAO

Rapporteur: Erica Dolinar, U. of North Dakota

- 1:30 p.m. *Status at NCEP to improve the stratosphere in reanalysis*
Craig Long, NCEP/CPC
- 1:50 p.m. *Aerosol modeling*
Sarah Lu, SUNY-Albany
- 2:10 p.m. *Water vapor in the stratosphere*
John McCormack, Naval Research Laboratory
- 2:30 p.m. *Aerosol Reanalysis at NASA Goddard Space Flight Center*
Arlindo da Silva, NASA/GMAO
- 2:50 p.m. Discussion
Moderator: Dan Barrie, NOAA/CPO
- 3:10 p.m. Coffee Break

3. Assimilation Development and Experiments: Atmosphere

Objectives: Exchange reanalysis approaches, algorithms, and techniques currently in use and under development. Discuss techniques for addressing outstanding issues in the reanalysis efforts

Session Chair: Arun Kumar, NCEP/CPC

Rapporteur: Lisan Yu, WHOI

- 3:30 p.m. *Developments in the Ensemble Kalman Filter*
Jeff Whitaker, NOAA/ESRL/PSD

- 3:50 p.m. *Forecast results and QBO response from NCEP conventional data only*
T254 EnKF only cycling semi-Lagrangian Reanalysis in 1970, 1981
Jack Woollen, IMSG & NCEP/EMC

- 4:10 p.m. *Hybrid Data Assimilation at NCEP*
Daryl Kleist, U. of Maryland

- 4:30 p.m. *New applications of Data Assimilation to Reanalysis*
Eugenia Kalnay, U. of Maryland

- 4:50 p.m. *Reanalysis for Tambora 1815*
Gil Compo, U. of Colorado/CIRES & NOAA/ESRL Physical Sciences
Division

- 5:10 p.m. Discussion
Moderator: Gil Compo

- 5:30 p.m. Close for day

- 6:30 p.m. Informal dinner at Franklin's

Tuesday 5 May

4. Assimilation Development and Experiments: Ocean and Sea ice

Objectives: Exchange reanalysis approaches, algorithms, and techniques currently in use and under development. Discuss techniques for addressing outstanding issues in the reanalysis efforts

Session Chair: Suru Saha, NCEP/EMC

Rapporteur: Yan Xue, NCEP/CPC

- 8:30 a.m. *NASA ocean data assimilation*
Guillaume Vernieres, NASA/GMAO SSAI
- 9:00 a.m. *Impacts of ocean observations on NCEP GODAS analysis*, Yan Xue,
NCEP/CPC
- 9:15 a.m. *Advancing Ocean Data Assimilation and Reanalysis*
Steve Penny, U. of Maryland & NCEP
- 9:30 a.m. *UMD SODA -- problems and progress*
Jim Carton, U. of Maryland
- 9:45 a.m. *The development of NSST within the NCEP GFS/CFS*
Xu Li, NCEP/EMC
- 10:00 a.m. Coffee Break
- 10:30 a.m. *ENSO in a large ensemble of historical reanalyses*
Ben Giese, Texas A&M University
- 10:45 a.m. *Land data assimilation at NCEP/EMC*
Mike Ek and Jesse Meng, NCEP/EMC
- 11:00 a.m. *Sea ice development at NCEP/EMC*
Xingren Wu, NCEP/EMC
- 11:15 a.m. Discussion
Moderator: Jim Carton, U. of Maryland
- 12:10 p.m. Lunch

5. Reanalysis Evaluation

Objective: Identify the various requirements for reanalysis products.

Session Chair: Jim Carton, U. of Maryland

Rapporteur: Steve Penny, U. of Maryland

- 1:30 p.m. *Dry-mass conservation and water consistency in reanalysis*
Ricardo Todling, NASA/GMAO
- 1:50 p.m. *Air-sea heat and freshwater fluxes in Atmospheric Reanalyses*
Lisan Yu, Woods Hole Oceanographic Institute
- 2:10 p.m. *Impacts of NCEP Reanalysis R2 and CFSR fluxes on MOM4 simulations*
Caihong Wen, NCEP/CPC
- 2:30 p.m. *Evaluation and intercomparison of clouds, precipitation, and radiation budgets in recent reanalyses using satellite-surface observations*
Erica Dolinar, U. of North Dakota
- 2:50 p.m. Coffee Break
- 3:10 p.m. *Investigation of two extreme summer Arctic sea-ice extent anomalies in 2007 and 1996*
Xiquan Dong, U. of North Dakota
- 3:30 p.m. *Reanalysis evaluation in polar regions*
Richard Cullather, NASA/GMAO
- 3:50 p.m. Rapporteurs give 5 minute summary of their session
- 4:15 p.m. Discussion and writing assignments
Moderator: Gil Compo
- 5:00 p.m. Close of Workshop